

X-RAY VARIABILITY: A PROBE OF HEATING

MECHANISMS OF INACTIVE CORONAE

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Final Report

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1 Analysis Summary

Data analysis of the ROSAT observations was carried out by Drs. Jay Bookbinder and Steve Saar which included the primary calibration of all of the ROSAT spectra. In addition, several students have participated in the analysis, performing flux calculations, background subtractions, temporal filterings, and time series analysis. The time series analysis was carried out using a moving-phase average extension to a classical chi-squared test.

All of these analyses were collated and incorporated into a database at CfA on Dr. Bookbinder's computer.

2 Science Summary

X-ray variability was detected on all timescales from approximately tens of seconds to hours. At the shorter end of this timescale, significant difficulties were encountered in removing the signal imposed by the PSPC "sweep" over the target. Temporal filters were used, but the signal was not perfectly periodic, limiting the usefulness of Fourier transforms to reduce this noise. The data we obtained, however, are still the best that ROSAT ever obtained because of the offsets that were applied to the observations to minimize this problem.

3 Current Status

The above general descriptions of the research carried out under this program are all that is currently available.

The computer disk that all the analyses were performed on experienced a devastating malfunction that destroyed all data on the disk. This included not only the calibrated data, but also all the IDL analysis routines we developed to analyze the spectra, all the databases, and all interim written results on the analysis. Efforts were made to recover the disk using commercial disk recovery firms, but their efforts were unsuccessful. Backups that were being made nightly by the SAO HEAD Systems Group failed without giving warning errors, due to a subtle bug in the Solaris operating system. No backups are therefore available. Unfortunately, all that remains are the original, uncalibrated raw data.

It is not clear that any additional efforts will be made of this data in the immediate future. As funding sources are identified, it is our hope to re-do most of the analysis and continue with publication of the results.